

Patent Claims

1. A method for load limiting in an aircraft high-lift system, with the aircraft high-lift system having a branching drive system for mechanical power transmission to drive stations (25) of individual segments (3, 4, 5, 6) of landing-flap and/or leading-edge slat systems, position sensors (8, 9, 17) and a drive unit (7), characterized by the following method steps:

- measurement (231) of signals from at least two position sensors;
- calculation (232) of at least one reference variable from the measured signals;
- 15 - comparison (233) of each reference variable with a corresponding threshold value which is predetermined from a maximum permissible load; and
- production (236) of a control signal in order to limit the drive power when at least one of the reference variables reaches or exceeds the threshold value.

2. The method for load limiting as claimed in claim 1, characterized in that one of the reference variables includes at least one difference between measured signals from at least two position sensors.

3. The method as claimed in claim 1 or 2, characterized in that two signals are measured with a known time interval at at least one position sensor.

4. The method as claimed in claim 3, characterized in that one of the reference variables includes a function of the angular velocity.

35 5. The method as claimed in one of claims 3 or 4, characterized in that one of the reference variables includes a function of the acceleration.

6. The method as claimed in one of claims 1 to 5, characterized in that one of the reference variables uses a calculated load.
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7. The method as claimed in one of claims 1 to 6, characterized in that the drive power of the drive unit is determined.
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8. The method as claimed in one of claims 1 to 7, characterized in that the drive power of the drive unit is limited (237) using the control signal.
9. The method as claimed in one of claims 1 to 7, characterized in that the drive power of the drive unit is limited (237) in a highly dynamic manner using the control signal.
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10. The method as claimed in one of claims 1 to 9, characterized in that a threshold value is predetermined appropriately for an operating state.
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11. The method as claimed in one of claims 1 to 10, characterized in that one of the reference variables includes a function of a state variable, which is estimated by means of mathematical methods, from a group comprising position, velocity and load.
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12. An apparatus for load limiting in an aircraft high-lift system, with the aircraft high-lift system having a branching drive system for mechanical power transmission to drive stations (25) of individual segments (3, 4, 5, 6) of landing-flap and/or leading-edge slat systems, position sensors (8, 9, 17) and a drive unit, characterized in that the apparatus has a monitoring unit (23) for load limiting which is connected to the position sensors (8, 9, 17) and is designed to process signals from the position sensors
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and to produce a signal in order to limit the drive power that is supplied.

13. The apparatus as claimed in claim 12,
5 characterized in that the position sensors have an angle position transmitter (17) on the drive unit, and/or angle position transmitters (15, 16), which operate as asymmetry transmitters, at the ends of the drive trains (8, 9).

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14. The apparatus as claimed in claim 12 or 13,
characterized in that the position sensors have angle position transmitters (125, 126) on branching transmissions (11, 111, 112) of the drive trains
15 (8, 9).

15. The apparatus as claimed in one of claims 12 to 14, characterized in that the power of the drive unit (7) can be controlled in a highly dynamic manner.

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16. The apparatus as claimed in one of claims 12 to 15, characterized in that a shaft section (27) of defined high flexibility is arranged between the drive unit (7) and the first branching transmission (26).